UI Bulletin 89c

Subject:	Installation of Electrical Aftermarket Accessories on 2-Mode Hybrid Full Size Trucks
Models Years Affected:	2008-2013 Cadillac Escalade Hybrid 2008-2013 Chevrolet Tahoe Hybrid 2009-2013 Chevrolet Silverado Hybrid 2008-2013 GMC Yukon Hybrid 2009-2013 GMC Sierra Hybrid
Origination Date:	November 23, 2011
Revision Date:	June 7, 2017

ADVISORY:

This bulletin is being revised to add the 2013 model year. Please discard Corporate Bulletin Number 09-08-45-003D (Section 08 - Body and Accessories).

Condition/Concern:

The GM 2-Mode Hybrid utilizes a sophisticated electrical architecture, with generated electrical power coming from the Auxiliary Power Module (APM) rather than a traditional alternator. For the 2008-2010 model years, the electrical capacity of the system was sized to power all the electrical features built into the vehicle but was not designed to accommodate significant aftermarket accessory electrical draw. Limitations of low draw devices (less than 25 amps total) on 2008-2010 hybrid models are outlined below for each model year and RPO.

For the 2011-2013 model years, the system has been redesigned to accommodate aftermarket accessory electrical draw as specified below. The 2011-2013 vehicles have the same 12 volt DC power delivery capability (for aftermarket accessories and equipment) as an otherwise equivalent 1/2 ton standard alternator equipped truck regardless of the attachment method. The available capacity is similar to a truck with a 160 amp alternator. The same application considerations apply.

Electrical accessories marketed through GM dealers (with GM Part Numbers) under the "GM Accessories" brand have been evaluated and meet all electrical requirements. GM only approves of the specified aftermarket electrical accessories installation as outlined below:

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2008-2010 Models	
Model	**Aftermarket Electrical Accessories Allowed**
Tahoe/Yukon/Escalade Hybrids	No aftermarket electrical accessories
Silverado/Sierra Hybrids with trim packages 2HY/3SB respectively	No aftermarket electrical accessories
Silverado/Sierra Hybrids with trim packages 1HY/3SA respectively	Radio installations only

2011-2013 Models	
Model	**Aftermarket Electrical Accessories Allowed**
Escalade Platinum Hybrids	No aftermarket electrical accessories allowed on the Mid-Bussed Electrical Connector (MBEC), otherwise no specific hybrid model restrictions (for battery direct applications, see Note below).
Escalade & Tahoe/Yukon Hybrids without Hybrid Municipal Package RPO WRJ or WRK Silverado/Sierra Hybrids	Aftermarket electrical accessories allowed with a combined maximum electrical load of 25 Amps on the Mid-Bussed Electrical Connector (MBEC), otherwise no specific hybrid model restrictions (for battery direct applications, see Note below).
Tahoe/Yukon Hybrids with Hybrid Municipal Package RPO WRJ or WRK	Aftermarket electrical accessories allowed with a combined maximum electrical load of 25 Amps on the Mid-Bussed Electrical Connector (MBEC) and 45 Amps on the additional power distribution center(s), otherwise no specific hybrid model restrictions (for battery direct applications, see Note below).

Note: For guidelines concerning direct battery connected accessories including high current devices (e.g. winches, power inverters, etc.) on 2011 and beyond GM Hybrid trucks, please refer to the GM Upfitter Integration website at www.gmupfitter.com. The guidelines below apply to the use of existing OEM power distribution centers and wiring. They do not address direct battery connected applications. Attachment of high current draw devices on 2008-2010 MY GM hybrid trucks is not recommended.

Important: If the BCM requires reprogramming as part of an accessory installation, the Brake Pedal Position (BPP) sensor MUST be re-calibrated on 2012 and newer vehicles.

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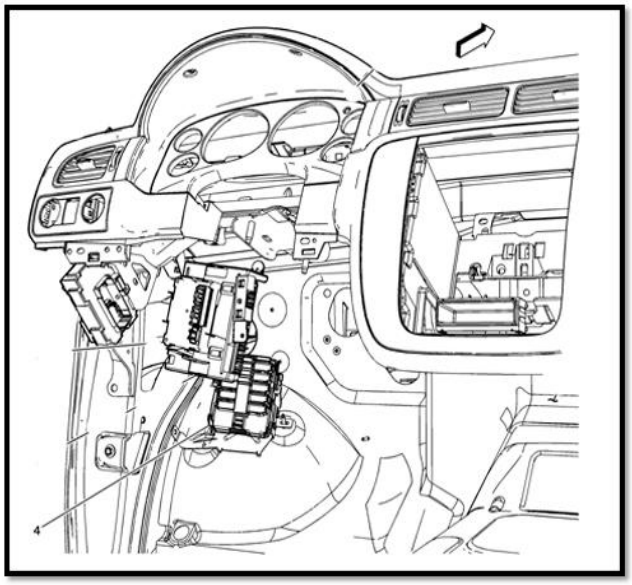
The following will outline accessing and connecting the electrical aftermarket equipment to the vehicle power and ground as approved above.

Radio Installation Instructions (2009-2010 Silverado/Sierra Hybrids with RPOs 1HY/3SA Only)

The location for the radio power and ground can be acquired at the Mid-Bussed Electrical Connector (MBEC). The power and ground can be connected at this location without having to splice or cut into the existing wiring.

Danger: The wire harnesses and cables for the hybrid high voltage circuits are encased in an orange colored covering. In addition, high voltage components such as the Energy Storage System and high voltage cables are affixed with “High Voltage” red danger, and orange warning labels. The intermediate 42 volt system is encased in a blue colored covering, and has yellow caution labels on the components, wire harnesses, and cables. Do not remove, open, take apart, or modify these devices. Do not probe, tamper with, cut, or modify high voltage, or intermediate voltage cable or wiring.

MBEC Connection



The MBEC (4) is located below the instrument panel to the left of the brake pedal as shown above.

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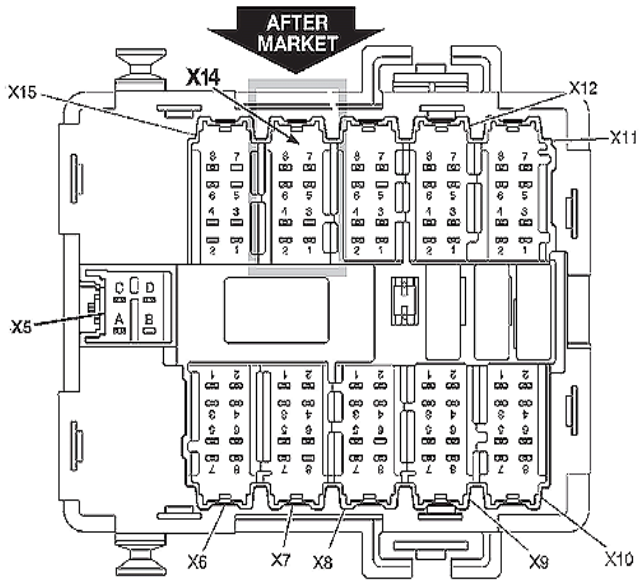

The MBEC has 10 positions for connecting electrical connectors. One of these positions is designated for aftermarket utilization. Install a connector (P/N 20791502) into the open position identified as X14 as shown above.

Important: Connector P/N 20791502 comes with a one wire lead installed. This lead will need to be removed before the connector is pinned for use with a radio.

Within this connector, there is a fused 30 Amp battery feed, a fused 15 Amp battery feed, a fused 10 Amp Run/Crank feed, a 300 milliamp Retained Accessory Power (RAP) feed and a ground.

Caution: Do not connect any components to cavity 2 (15 Amp Battery Feed), or cavity 8 (300 milliamp RAP Feed). Adding electrical draw to any of these circuits can cause vehicle performance issues and potentially decreased life of the APM.

The pin out of the connector is as follows:

Cavity	Circuit Description	Circuit Number	Fuse Size
1	*Ground*	1050	NA
2	Battery Feed *(Do Not Use)*	4540	15 Amps
3	Not Used	—	—
4	Not Used	—	—
5	*Battery Feed*	2340	30 Amps
6	Not Used	—	—

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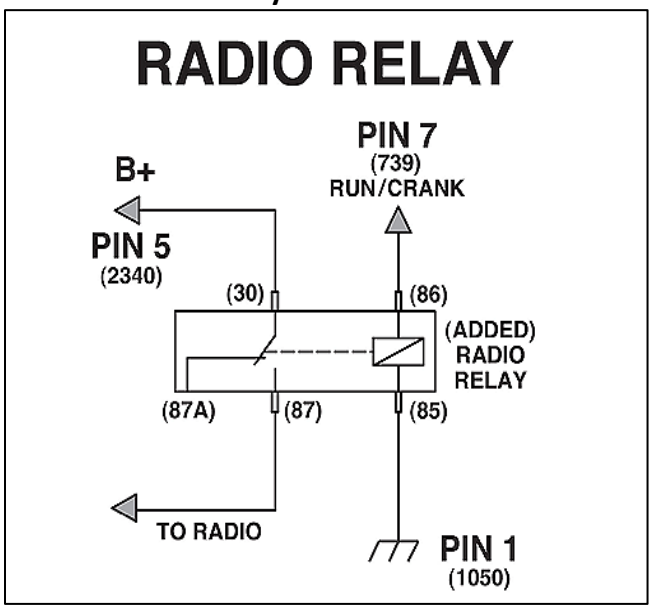
Cavity	Circuit Description	Circuit Number	Fuse Size
7	*Run/Crank Feed*	739	10 Amps
8	RAP Feed *(Do Not Use)*	43	300 milliamps

Wire Gauge Selection

For any of these powered connections to be used, circuit protection guidelines must be followed to assure that the circuit gauge is selected appropriately so that it will be protected by the fuse in case of a short circuit.

Relay Installation



Install relay (P/N 12193601) with 5-way pigtail connector (P/N 15306045) as shown in the above diagram to ensure the load from the radio is connected to the 30 amp Battery feed, and not the 10 amp Run/Crank circuit. Connect the 30 amp Battery Feed (circuit 2340) from pin 5 of the MBEC to pin 30 of the relay. Connect pin 87 of the relay to the radio. Connect the 10 amp Run/Crank (circuit 739) from pin 7 of the MBEC to pin 86 of the relay coil. Connect pin 85 of the relay coil to Ground (circuit 1050) on pin 1 of the MBEC.

Caution: To prevent damage to any sensitive electronic components, use the relay listed which includes a suppression resistor circuit. The integral suppression resistor will prevent a voltage spike from being transmitted onto the Run/Crank circuit. Damage to the vehicle by failing to install this relay as part of this aftermarket installation is not covered under warranty.

Parts Information

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Part Number	Description	Qty
20791502	Connector	1
12177233	Relay	1
13580863	5–Way Connector w/Leads	1
19151475	Relay Bracket	1

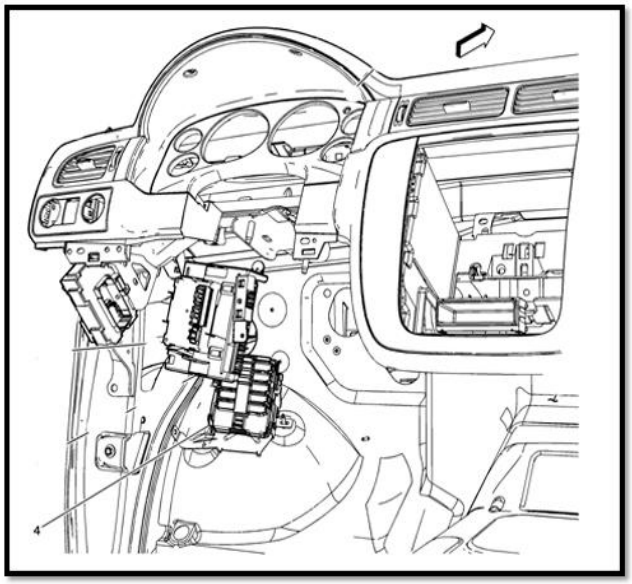
Accessory Installation Instructions (All 2011-2013 Hybrid Models, Excluding Escalade Platinum Hybrid)

The location for the accessory power and ground can be acquired at the Mid-Bussed Electrical Connector (MBEC). The power and ground can be connected at this location without having to splice or cut into the existing wiring. The total power available at the Mid-Bussed Electrical Connector (MBEC) location is 25 amps.

Danger!

The wire harnesses and cables for the hybrid high voltage circuits are encased in an orange colored covering. In addition, high voltage components such as the Energy Storage System and high voltage cables are affixed with “High Voltage” red danger, and orange warning labels. The intermediate 42 volt system is encased in a blue colored covering, and has yellow caution labels on the components, wire harnesses, and cables. Do not remove, open, take apart, or modify these devices. Do not probe, tamper with, cut, or modify high voltage, or intermediate voltage cable or wiring.

MBEC Connection



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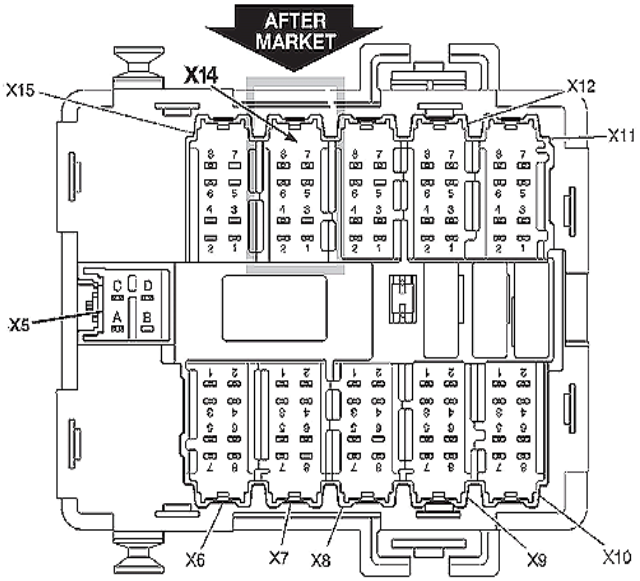
The MBEC (4) is located below the instrument panel to the left of the brake pedal as shown above.



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Important: Connector P/N 20791502 comes with a one wire lead installed. This lead will need to be removed before the connector is pinned for use with an accessory.

Within this connector, there is a fused 30 Amp battery feed, a fused 15 Amp battery feed, a fused 10 Amp Run/Crank feed, a 300 milliamp Retained Accessory Power (RAP) feed and a ground.

Caution: Do not connect any components to cavity 2 (15 Amp Battery Feed), or cavity 8 (300 milliamp RAP Feed). Adding electrical draw to any of these circuits can cause vehicle performance issues and potentially decreased life of the APM.

The pin out of the connector is as follows:

Cavity	Circuit Description	Circuit Number	Fuse Size
1	*Ground*	1050	NA
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5	*Battery Feed*	2340	30 Amps
6	Not Used	—	—
7	*Run/Crank Feed*	739	10 Amps
8	RAP Feed *(Do Not Use)*	43	300 milliamps

Wire Gauge Selection

For any of these powered connections to be used, circuit protection guidelines must be followed to assure that the circuit gauge is selected appropriately so that it will be protected by the fuse in case of a short circuit.

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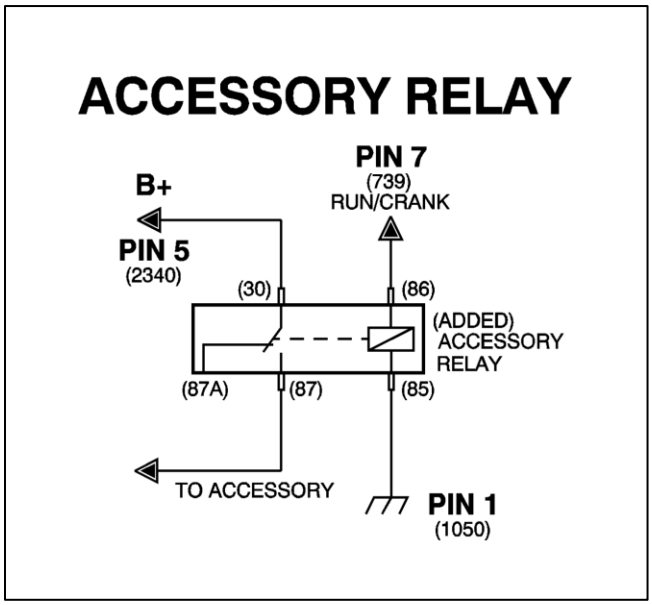
Relay Installation



Install relay (P/N 12193601) with 5–way pigtail connector (P/N 15306045) as shown in the above diagram to ensure the load from the accessory is connected to the 30 amp Battery feed, and not the 10 amp Run/Crank circuit. Connect the 30 amp Battery Feed (circuit 2340) from pin 5 of the MBEC to pin 30 of the relay. Connect pin 87 of the relay to the accessory. Connect the 10 amp Run/Crank (circuit 739) from pin 7 of the MBEC to pin 86 of the relay coil. Connect pin 85 of the relay coil to Ground (circuit 1050) on pin 1 of the MBEC.

Caution: To prevent damage to any sensitive electronic components, use the relay listed which includes a suppression resistor circuit. The integral suppression resistor will prevent a voltage spike from being transmitted onto the Run/Crank circuit. Damage to the vehicle by failing to install this relay as part of this aftermarket installation is not covered under warranty.

Parts Information

Part Number	Description	Qty
20791502	Connector	1
12193601	Relay	1
15306045	5–Way Connector w/Leads	1
19151475	Relay Bracket	1

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Available Power Distribution System (2011-2013 Tahoe/Yukon Hybrids with Hybrid Municipal Package RPO WRJ or WRK)

The Hybrid Municipal Package consists of a power distribution system integrated into the vehicle 12 volt electrical system at the front compartment (RPO WRJ) or front compartment and rear cargo area (RPO WRK). All aftermarket electrical equipment and accessories must be wired to the fused circuits provided in the upfitter 12 volt power distribution panels. The power and ground can be connected at these locations without having to splice or cut into the existing vehicle wiring. The total amount of power available to the panel(s) is 45 amps (540 watts). The power distribution system simplifies upfitting and avoids connection to critical components of the Hybrid vehicle electrical system.

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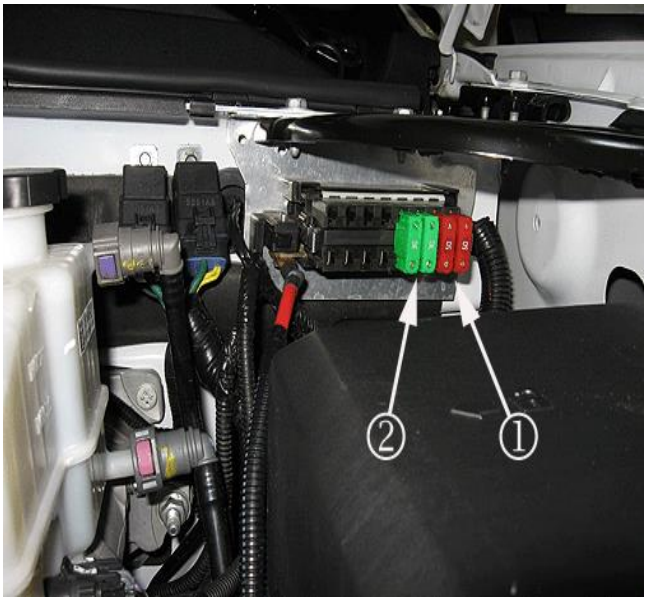
The system consists of a 12 volt battery feed coming directly from the battery to an underhood fuse block. The underhood fuse block is protected by a fusable link in the feed wire coming from the battery. The underhood fuse block feeds the single front compartment fuse block (RPO WRJ) or both the front compartment and rear cargo area fuse block (RPO WRK) with direct 12 battery and ignition.



Both the front compartment and rear cargo fuse blocks are protected by maxi fuses in the underhood fuse block. There are two 50 amp maxi fuses, (1) to protect each fuse block battery circuit and two 30 amp maxi fuses, (2) to protect each relay and fuse block ignition

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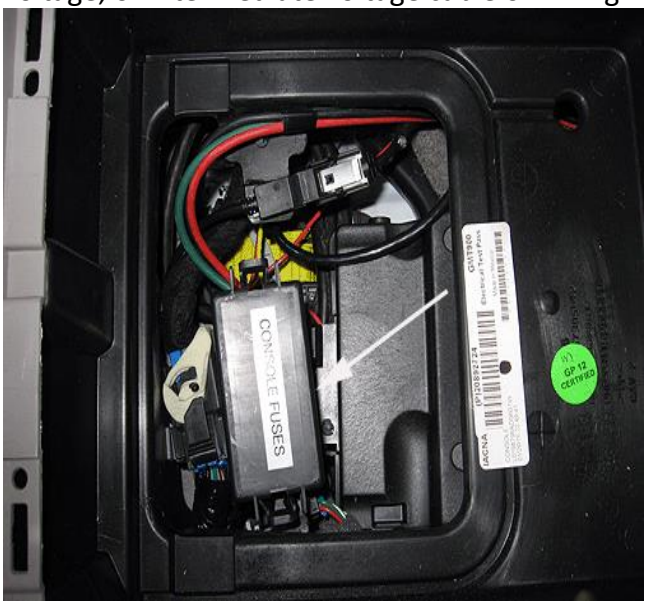
circuit. The ignition is controlled through either a single relay (RPO WRJ) or dual relays (RPO WRK).

Chassis ground can also be accessed at both the front compartment and rear cargo area fuse blocks.

Accessing Power and Ground from the Power Distribution System

Danger!

The wire harnesses and cables for the hybrid high voltage circuits are encased in an orange colored covering. In addition, high voltage components such as the Energy Storage System and high voltage cables are affixed with “High Voltage” red danger, and orange warning labels. The intermediate 42 volt system is encased in a blue colored covering, and has yellow caution labels on the components, wire harnesses, and cables. Do not remove, open, take apart, or modify these devices. Do not probe, tamper with, cut, or modify high voltage, or intermediate voltage cable or wiring.



The front compartment fuse block is located in the front floor console. To access, remove the front floor console bezel. Refer to Floor Console Bezel Replacement in SI.

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The rear cargo area fuse block is located under the left rear quarter trim panel. To access, remove the left rear cup holders.

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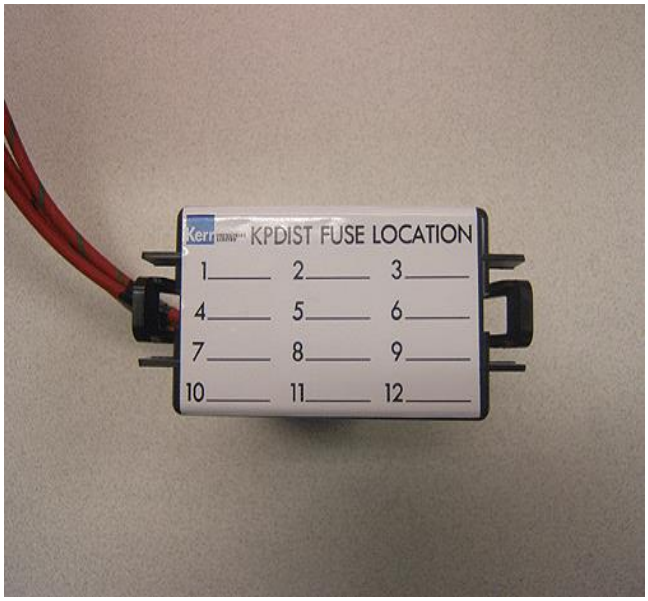
Front and Rear Fuse Block Connection

The procedure to connect to the power and ground to either the front compartment or rear cargo area fuse block is the same. Follow the procedure below.

1. Disconnect the 12 volt battery feed coming directly from the battery to the underhood fuse block. This will remove power from the front compartment fuse block and rear cargo area fuse block, allowing a safe connection.
2. Access the fuse block by removing any tie raps retaining the fuse block. Pull the fuse block out so that it can easily be accessed.



3. Remove the cover.

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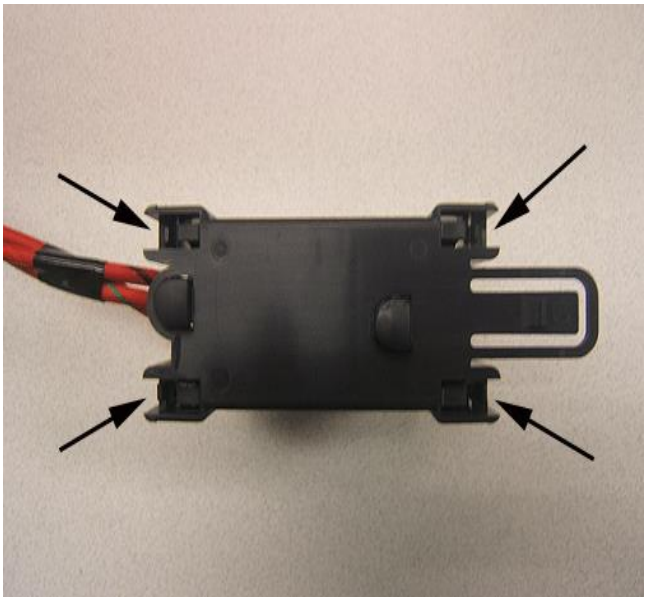
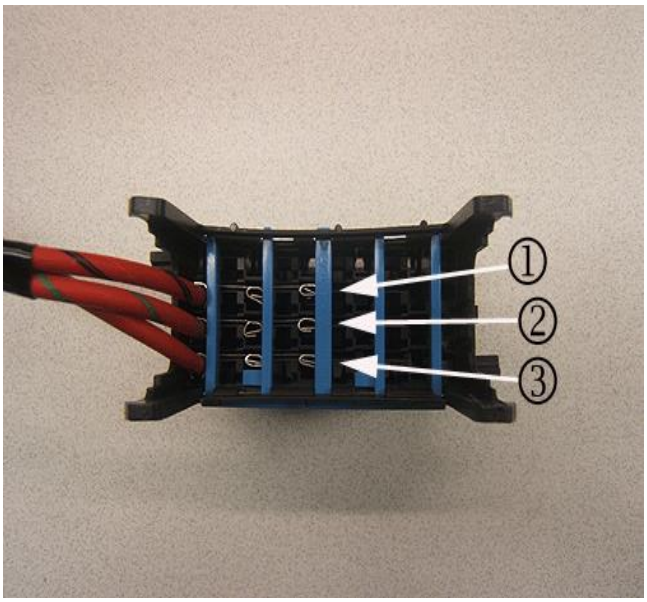


4. Remove the fuse block base by using a small screwdriver to release the four locks (1).



5. Contained within the fuse block are three bus bars. Ground (1). Ignition (2). Battery (3).

Note: Wire colors shown are not representative of production.

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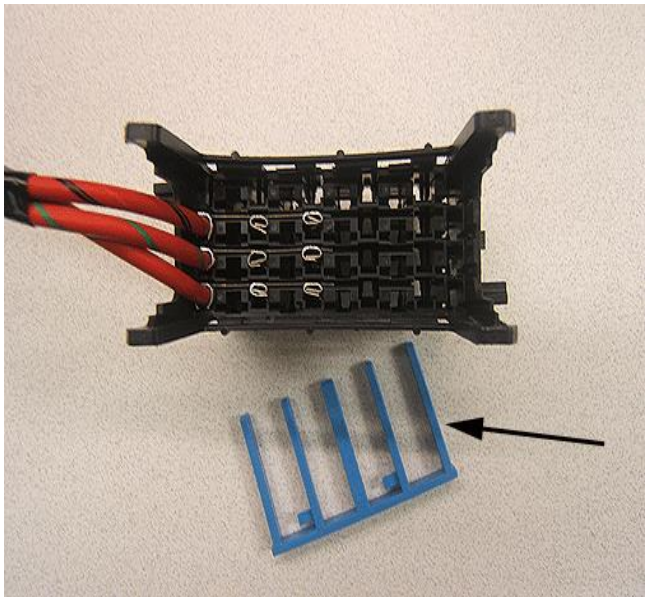

6. Remove the blue terminal retainer (comb) from the fuse block.
7. Up to 3 circuits can be connected up to each bus bar. This comprises of 3 grounds, 3 battery feeds, and 3 ignition feeds.

8. The Power Distribution System includes 9 loose terminals provided in a plastic bag. These terminals will be used to connect the electrical accessory(s) to the fuse block.

   Note: The following steps can be used to connect to either the ground, battery or ignition feed bus bars.

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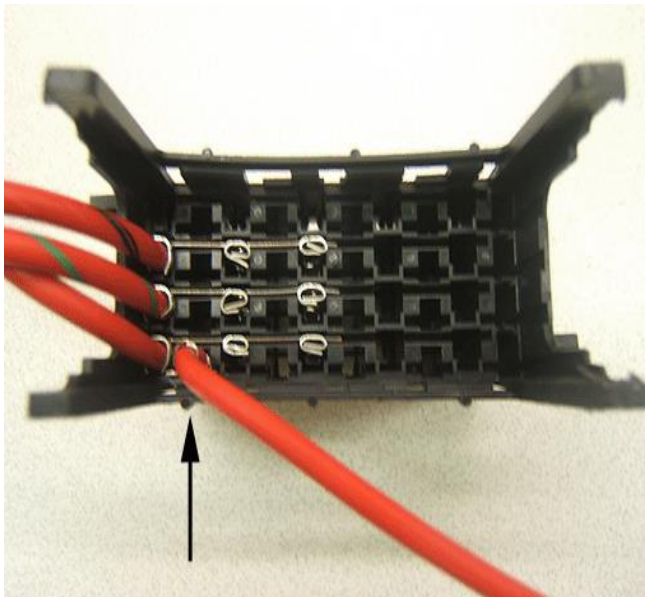
9. Using the proper crimping tool, crimp the terminal to the accessory wire.



10. Insert the terminal into the first available cavity of the bus bar you are connecting to. Ensure the terminal lock engages in the fuse block cavity.

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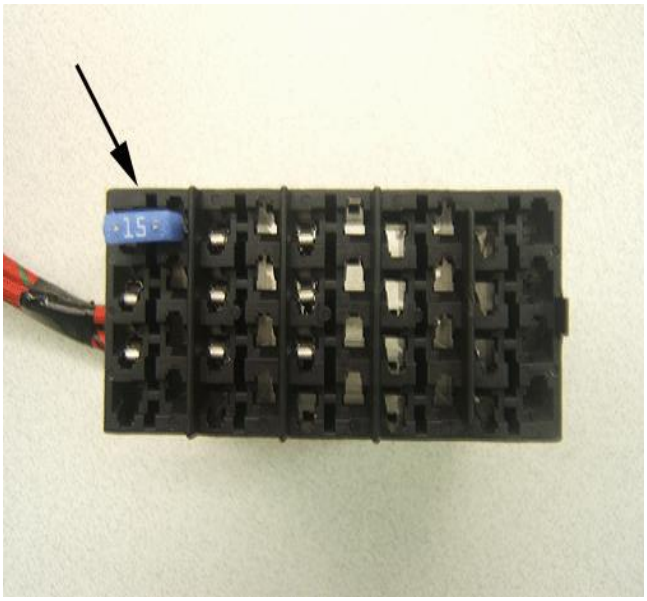

11. On the front side of the fuse block, insert a suitable mini fuse to bridge the bus bar to the terminal inserted.

    Important: The total power available to the panel(s) is 45 amps (540 watts).

    Note: A fuse must also be inserted into the fuse block when connecting to the ground bus bar. This fuse will be redundant to the power side fuse and only provides a connection from the ground bus bar to the terminal. This fuse must be equal in size to the power side fuse.

12. Connect the circuit(s) to the accessory.
13. Reinstall the fuse block base and cover.
14. Tie rap the fuse block/harness back into the original location.
15. Reconnect the battery feed disconnected in step 1.

Wire Gauge Selection

For any of these powered connections to be used, circuit protection guidelines must be followed to assure that the circuit gauge is selected appropriately so that it will be protected by the fuse in case of a short circuit.

Disclaimer: GM Upfitter Integration Technical Bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service and/or modification of a vehicle. These properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. Contact GM Upfitter Integration for information on whether the information is applicable your vehicle.